

NOTES ON SNAKES COLLECTED IN UPPER ASSAM.

BY

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During nearly two years' residence in Assam I collected 615 snakes representing 37 different species. This does not include the collection of 264 snakes I made in the Khasi Hills in the hot weather of 1907.

To be accurate I spent but 17 months in the Plains of Assam being stationed at Dibrugarh all this time.

Nearly all my specimens were collected in and around Dibrugarh by my own efforts, aided by the substantial help of many Planter friends. In addition to those living close at hand I received help from others at a distance, and my thanks are especially due to Mr. Cyril Gore of Jaipur (Namsang), Mr. Stevens and Dr. Elmes of North Lakhimpur (Dejoo and Joyhing), and Mr. J. H. Bandoek of Tinsukia, (Rangagara).

Dibrugarh is situated on the South bank of the Brahmaputra, at an elevation of 360 feet above sea level. The nearest Hills are the Abar Hills, which are part of, or at any rate, conterminous with, the Himalayas. These hills are about 25 miles distant. The Tippum Hills on the North of the Dihing River, and the Patkoi Range to the South of that river lie to the South-East of Dibrugarh, their nearest points being some 35 miles distant.

The average annual rainfall is 114.99 inches. This is distributed over several months in the year, unlike what obtains in India. Thus in the hot weather instead of the scorching drought of India, rain falls plentifully at spasmodic intervals, separated by spells of a few days fine weather. The result is a very humid atmosphere, and a most luxurious vegetation. The cold weather is pleasant, fires are a necessity from about November to February, and it often freezes at night. During these months few snakes were about, though plentiful during other parts of the year.

It will be seen from the annexed register, which is made out in tabular form that of the 615 specimens 555 were harmless and 60 poisonous. There were thus 2 poisonous snakes in every 20.

No case of snake poisoning came to my knowledge, and on making enquiries at the Civil Hospital I was told that no case of snake poisoning had ever been treated there.

TYPHILOPIDÆ.

Typhlops braminus (Daudin).

I obtained 15 specimens, mostly in the months of April and May, and all in Dibrugarh. No less than 9 of these were ♀♀, and all gravid in April and May. The rest I believe were ♂♂. All the ♀♀ ranged in length between 6 and 6½ inches. There are at least two distinct colour varieties, the one dark-brownish, or brownish-black, and the other a very pale grey similar to the colour of a new slate pencil for which I propose the name *pallidus*. I got three specimens of the latter which is evidently less common. In all of these specimens the eyes were quite invisible, differing thus from typical examples of this species, but I could observe no differences in lepidosis between them and the common variety.

In the gravid specimens the eggs varied in number from 2 to 7, were very elongate and resembled grains of boiled rice. The largest measured $\frac{2}{3}\frac{1}{2}'' \times \frac{5}{3}\frac{1}{2}''$. In life it is an agile restless little creature. I noticed the tongue which was white at the tips protruded as in other snakes. It is difficult to hold owing to its glossy scales, and agility. In one's grasp it pushes vigorously with its head, and insinuates itself forcibly between the clefts of the fingers, at the same time depressing its caudal extremity so as to push the little spine with which it is endowed against the skin with sufficient force for one to be sensible of its acuity. It seems to use this little spine to anchor itself, whilst it circles round it as on a pivot.

Typhlops diardi, Schlegel.

Twenty specimens, 14 from Dibrugarh, 3 from Sadiya and one each from near Tinsukia, near Doom Dooma, and near Halem. One adult specimen was of a very pale grey colour, constituting a distinct colour variety for which I suggest the name *cineus*. In this the eyes were almost invisible. In most of the specimens the scales were 24 in midbody though 26 rows were not infrequent. I notice that the rows reduce posteriorly by two, thus at a point two heads-lengths before the anus they are 22 when the scales are 24 in midbody, and 24 when 26 in midbody. The absorption appears to be due to the disappearance of the row next to the median ventral, either into the median ventrals or the row on the outer side. I also noticed that in certain specimens the median ventral row is a shade broader than the adjacent rows. I think at any rate whether the enlargement is constant or not that the median ventral row should be considered ventrals in all the snakes of this family, and the *Glaucconidae*. If so considered the costals would be in odd rows, as in almost every other snake. In species in which the vertebral row is not enlarged, the median dorsal row is still the vertebral, and to be consistent the median ventral row should still be considered a true ventral though not enlarged. Analogy seems to me to indicate that this is the proper way to view these shields.

I had several specimens brought to me alive. It is a restless creature that is difficult to hold partly by reason of the slipperiness of its scales, and partly through its constant struggles. In moving it presses its terminal spine into the hand. I noticed that in progression the posterior part of the body is flicked

round, and the terminal spine fixed to the ground two or three inches forward. From this purchase the snake pushed the posterior body forwards till the snake was completely extended in its whole length when the caudal extremity was again flicked forwards and the spine again fixed. Placed in my bath I was surprised to see with what activity it was able to swim, its powers in this direction seeming as good as that of other snakes. In loose dry earth it pushed its head through the surface layers with great ease, often burrowing so superficially that much of its body was visible, but in damp or wet earth it plunged at once to some depth, and when sought for resisted traction efforts with considerable strength. Two ♀♀ were gravid, one on the 30th April, and one some time between the 1st March and 9th May. In one case there were 5 and in the other 6 eggs. One gravid specimen measured $11\frac{1}{4}$ inches. In the stomach and intestines of many I found numerous white oval bodies which I submitted to Dr. Annandale for favour of identification. These proved to be larvæ and pupæ of ants, and in many specimens too I found the cases of ant imagoes sometimes entire. Ants appear therefore to furnish the staple food of this snake. In one specimen both the parietals were confluent. The tongue in life has white tips.

BOIDE.

Python molurus (Linne).

This species is common in Assam. I had 4 specimens brought to me, all quite young, and I saw several large skins in Planters' bungalows. In my specimens the ventrals and subcaudals were as follows :—260+68, 263+68 and 256+68. In one the 54th, 55th, 58th to 62nd, and 65th and 66th subcaudals were entire. The anal was entire in all. At a point two heads lengths after the head the costals in three were respectively 54, 56 and 58 rows, at midbody 69, 63 and 70, and two heads-lengths before the anus 44, 44 and 43. I notice that the last 4 costal rows progressively increase in size the last being just one-half the breadth of the ventrals. Several Planters and others gave me information about the specimens they had encountered. Dr. Elmes shot one 19 feet long which he saw lying on a little knoll in a jheel ("bhil" is the local name for these sheets of water). It had swallowed two large and two small water rats, and two or three toads. His servants last year killed a specimen in his fowl house about 12 to 14 feet long. It presented a beaded appearance, and when opened was found to contain 5 of his ducks, 4 fowls and 1 pigeon. A neighbour of Dr. Elmes killed one last year which contained a barking deer. He personally saw the deer cut out and judged the horns to be fully a foot long. These, he says, were softened and rounded off at the tips as a result of digestive activity. Mr. Staunton had one brought in to him that had swallowed three farmyard ducks. Mr. Copeland had a 15 footer killed on his estate last year, which had eaten a hog deer. The snake when surrounded, and hustled by his coolies, tried to make off, but in so doing the horns of the deer, some 7 or 8 inches in length, penetrated the flanks, and protruded through the ribs. Mr. Harry has a large skin preserved. When killed, the snake was found to contain a barking deer the horns of which were four to six inches in length. Mr. J. H. Mitchell wrote

to me from Halem of a specimen he had lately killed in the act of swallowing a fowl. When opened, he found "about a double handful of earthworms and a handful of a berry, which the natives call jaman," in the stomach. Though pythons are known to be fairly omnivorous, this is the first time that I have ever heard of either worms or fruit being ingested, and it is difficult to account for such material in the stomach except as the result of deliberate intention. Pythons harbour many parasites, but it is difficult to believe that any of these could be mistaken for earthworms.

COLUBRIDÆ.

Tropidonotus piscator (Schneider)

Called by the Assamese "dhora." On one occasion when one was killed at the railway workshops all the Indian coolies agreed in calling it "dhor" but the Assamese present called it "dhora" the name I have on other occasions always heard them use for this species.

This snake is as plentiful in the Plains of Assam as it is in most other parts of our Indian Dominions. The great majority of specimens have large, and very conspicuous black spots conforming to variety *quincunciatus* of Schlegel. A fair number had small black chequering, and in others chequering was obscure or absent. Many of these appeared to me to be approaching their ecdysis, and for this reason were sombrely decked. I could discern the indications of dark chequering, and believe that in many cases, if not all, the desquamation would have revealed the typical black ornamentation. Of variety *quincunciatus* I saw none ornamented with red. 111 specimens—not including those I hatched from eggs—came to bag, and a record of those that call for remark had best be shown in tabular form. It is remarkable what a marked preponderance there is of ♀ over ♂. Of 77 specimens sexed by me 57 were ♀ ♀, and of 8 hatchlings of the same brood 6 were ♀ ♀.

Date.	Sex.	Length.	REMARKS.
1907.			
March 21st...	♀	1'-8 $\frac{3}{4}$ "	
April 1st ...	♀	3'-6 $\frac{1}{2}$ "	Contained 39 eggs (23+16) $\frac{1}{16}$ " to $\frac{1}{16}$ " long.
" 1st ...	♂	2'-6 $\frac{3}{4}$ "	
" 3rd ...	♀	3'-5"	Contained 44 eggs, the longest 1 $\frac{2}{16}$ " long.
" 8th ...	♀	1'-10 $\frac{1}{2}$ "	
" 10th ...	♀	3'-2 $\frac{3}{4}$ "	Very thin, probably had just laid eggs.
" 13th ...	♀	3'-9 $\frac{1}{4}$ "	Contained 51 eggs (25+26,) $\frac{1}{16}$ " to 1" in length in two rows.
" 19th ...	♀	4'-1 $\frac{1}{4}$ "	Contained 53 eggs (33+20) $\frac{3}{32}$ " long.
" 20th ...	♀	3'-6"	Contained 21 eggs, $\frac{3}{32}$ " to $\frac{3}{16}$ " long.
" 23rd ...	♀	3'-0 $\frac{1}{2}$ "	Contained 34 eggs (21+13) $\frac{1}{16}$ " long.
" 27th ...	♀	2'-4 $\frac{1}{2}$ "	
" 28th ...	♂	1'-11 $\frac{1}{2}$ "	
May 1st ...	♀	1'-9 $\frac{1}{2}$ "	
" 1st ...	♀	3'-5 $\frac{3}{4}$ "	Contained 44 eggs (21 + 23) $\frac{2}{32}$ " long.
" 9th ...	♀	2'-10 $\frac{1}{4}$ "	
" 10th ...	♂	1'-4 $\frac{1}{2}$ "	

Date.	Sex.	Length.	REMARKS.
1907.			
May 14th ...	♀	4'-2 $\frac{3}{4}$ "	Very thin, probably had just laid eggs.
" 16th ...	♀	1'-11"	
" 23rd ...	♀	
" 26th ...	♀	2'-0 $\frac{3}{4}$ "	
" 30th ...	♀	1'-10 $\frac{1}{4}$ "	
.....		2'-0"	
June 10th ...	♀	2'-0 $\frac{1}{2}$ "	
" 10th ...	♀	1'-11"	
" 12th ...	♀	2'-2 $\frac{3}{4}$ "	
" 13th ...	♀	1'-9 $\frac{1}{4}$ "	
" 13th ...	♀	2'-3 $\frac{1}{2}$ "	
" 14th ...	♀	2'-8 $\frac{1}{2}$ "	
" 16th ...	♀	2'-10 $\frac{1}{2}$ "	
" 17th ...	♀	6 $\frac{3}{4}$ "	A hatchling, tail slightly docked.
" 19th ...	♀	...	Very small, probably hatchling.
" 20th ...	♀	9 $\frac{1}{4}$ "	
" 21st ...	♀	7 $\frac{1}{2}$ "	
July 7th ...	♀	2'-4 $\frac{1}{2}$ "	
" 11th ...	♀	1'-11"	Had eaten a mouse.
" 23rd ...	♀	10"	
Oct. 12th ...	♀	3'-9 $\frac{1}{4}$ "	The nasals touch one another in front of the inter-nasals.
" 29th ...	♀	3'-9"	
Nov. 13th ...	♀	3'-2"	Had eaten a very large toad (<i>Bufo melanostictus</i>) breech first.
Dec. 30th ...	♀	...	
" 30th ...	♀	3'-5 $\frac{1}{2}$ "	31 small eggs (15+16), $\frac{1}{2}$ " long.
" 30th ...	♀	3'-3 $\frac{1}{2}$ "	22 small eggs, rather larger than last. These 3 specimens were all captured in removing a stack of bricks in a brick kiln. They were not in company but evidently attracted by the warmth.
1908.			
Jan. 3rd ...	♀	3' 3"	Contained 37 eggs (24+13) $\frac{6}{16}$ " to $\frac{9}{15}$ " long.
" 5th ...	♀	...	Containing 25 eggs (12+13) $\frac{5}{16}$ " \times $\frac{11}{14}$ " long.
" 14th ...	♀	3'-5"	Contained 22 eggs (17+5) $\frac{5}{16}$ " \times $\frac{11}{14}$ " long.
Feb. 9th ...	♀	1'-9 $\frac{1}{2}$ "	The nasals touch behind the rostral. 4 postoculars on left side. 9 supralabials, the 4 left only touching the eye.
" 9th ...	♀	2'-1 $\frac{3}{8}$ "	The nasals touch behind the rostral.
" 9th ...	♀	2'-10 $\frac{1}{2}$ "	A frog "in gastro"
" 9th ...	♀	3'-3 $\frac{1}{2}$ "	Contained 8 eggs (5+3) $\frac{5}{16}$ " long. A large fish "in gastro." 10 supralabials, the 5th left only touching the eye.
" " ...	♀	3'-8 $\frac{1}{2}$ "	Contained 49 eggs (21+28) $\frac{5}{16}$ " long. Remains of frog in stomach. Four postoculars on both sides.
" 22nd ...	♀	...	Contained 19 eggs (9+10) $\frac{5}{16}$ " long.
" 23rd ...	♀	1'-11"	Only 5th supralabial touching the eye on the right side.
" 25th ...	♀	3'-11"	Contained eggs $\frac{15}{16}$ " \times $\frac{10}{16}$ ". Four postoculars on both sides.
April 3rd ...	♀	3'-8 $\frac{3}{4}$ "	Contained 36 large eggs $\frac{3}{4}$ " \times 1"
" 11th ...	♀	2'-10 $\frac{1}{2}$ "	Contained 21 large eggs.
Oct. 19th ...	♀	...	A large toad (<i>Bufo melanostictus</i>) "in gastro"

* The tail was very incomplete but the full length is judged from other specimens of same body length.

In some of the gravid ♀♀ it was observed that some eggs were particoloured having a cinereous suffusion on one aspect. It was also observed that the pigmented patch had lain in opposition to a distended part of the intestine—and there seems little doubt that this colouration is due to absorption from the intestinal contents. I suspect that it is derived from pigment in the batrachian epidermis.

On the 21st May 1907 I received two large clusters of eggs of this species both unearthed in hoeing operations on a tea estate. One of these like a bunch of grapes contained 75 eggs. I extracted a ♀ embryo which measured $4\frac{3}{8}$ inches. The ventrals numbered 149, of which the 21st to 27th lay beneath the heart and the 84th beneath the gall bladder. A median raphé on the belly marked the union of the parietes, but the bond of union was so delicate that the slightest touch ruptured it, and allowed the viscera to protrude. The oviducts could be seen arising from just before the gall bladder and passed backwards as two tortuous, vermiform, white threads.

These embryos began to hatch on the 14th of June. I examined 8 of these critically. 6 were ♀♀ and 2 ♂♂. The ♀♀ varied in length from $6\frac{3}{8}$ to $7\frac{7}{8}$ inches, the average being a shade under $7\frac{1}{2}$ inches. It will thus be seen that these embryos grew at the rate of a little more than three inches in 24 days. The ventrals in the ♀ specimens varied from 150 to 152, in the ♂ from 141 to 145. The subcaudals in the ♀♀ ranged from 81 to 87 and in the ♂♂ from 91 to 95.

On the heads of all these specimens was a pair of small light spots one on each parietal, opposite the middle of the interparietal suture. I have observed these, I think, in all other hatchlings of this species, but they seem soon to disappear. In one of these specimens the 3rd subcaudal was entire. All of these were conspicuously spotted as in variety *quincunciatus* except one in which the black spots were obscure. The foetal tooth could not be seen in profile, but could be felt when searched for.

In the second cluster there were 30 odd eggs. I extracted an embryo two inches in length. The upper jaw was very imperfect and slightly cleft mesially. I could see no other gill arches though two sulci in the neck seemed to indicate the position of the 2nd and 3rd clefts. Immediately behind the rudimentary lower jaws lay the heart which could be observed pulsating.

These eggs shrivelled and the rate of growth of the embryos could not be ascertained. Some sepoys brought me in another clutch of eggs in the middle of June found in the river bank and reported that a snake was coiled up with them but escaped.

It will be seen that this species is common all the year round, more so in the hot weather.

This snake is usually infested with many parasites. The abdominal cavity is often teeming with an immature form of tapeworm which usually lies up under the lining membrane in a convoluted mass so large as to cause flattish blister-like swellings beneath the skin.

These parasites may attain a length of 8 or even 10 inches when extended. Dr. Annandale had them identified for me, and they were reported as a species of *Pterocercus* (larval forms of a tapeworm). Another common parasite is a small ascarid or round worm which inhabits the stomach (and upper part of the intestine?). It is frequently found in clusters attached firmly to the coats of the stomach, and the individuals of each colony vary a good deal in length. Some attain a length of 5 inches. I measured one $5\frac{1}{2}$ inches. This parasite sets up a chronic inflammatory thickening of the gastric coats. Sometimes the stomach becomes very much thickened, and indurated like cartilage. At the same time it is often puckered up, and distorted, and the surrounding tissues are often bathed in a watery dropsical fluid. This worm has been identified for me through Dr. Annandale as *Kalicephalus willeyi*. Larval and immature forms of another ascarid worm were found in the stomach and mesentery. A fourth parasite, which is less common, is frequently found attached to the outside coats of the intestine, or the lining membrane of the abdominal cavity. This is a maggot-like white parasite which has been also identified for me by Dr. Annandale as *Porocephalus brotali*. I have figured this curious creature showing the hooks by which it attaches itself.

Tropidonotus himalayanus, Gthr.

I collected 15 specimens, 10 from Dibrugarh, 3 from Jaipur, 1 from Sadiya, and 1 from near Tinsukia. 6 of the 8 specimens sexed were ♂♂, 2 ♀♀. The largest was a ♀ 2 feet 10 inches, the tail being $8\frac{1}{2}$ inches. The total length of a ♂ in which the tail was $8\frac{1}{2}$ inches was 2 feet $6\frac{1}{2}$ inches, so that it is obvious that the tail is longer in the ♂. The specific name is unfortunate for this snake is by no means confined to the Himalayas, nor is it exclusively a hill snake being found in the Brahmaputra Valley at some distance from Hills (25 to 35 miles at least). I obtained more than one specimen alive, but could not get them to bite me though they raised themselves, and flattened the neck in the manner so typical of the *Tropidonoti*. More than one specimen had recently fed, on two occasions a frog had been taken, in another a small toad (*Bufo melanostictus*). A hatchling was captured alive on the 26th of July. In this, and in another specimen that measured 1 foot $4\frac{1}{4}$ inches the collar was of a bright orange colour. In larger specimens this tones down to a cinnamon brown. The collar is bounded with black fore and aft. The brilliant vermilion band behind the collar, breaking up into a chequering, which I remarked upon in specimens from the Khasi Hills in this Journal (Vol. XVIII, p. 319) is not seen in specimens in the Plains. The scales where they are overlapped are of a very beautiful greenish blue colour which sets off the snake to great advantage when it dilates itself under excitement. All the specimens were very dark, in fact blackish with a tinge of olive, and the costal series of spots were of a cinnamon hue. One specimen was disturbed from beneath a box inside a bungalow. The ventrals in a ♀ were 172, and in 6 ♂♂ varied from 168 to 173. The subcaudals in one ♀ were 86, and in 6 ♂♂ 89 to 95. There were 4 postoculars on one side in one example. I noticed that the double

apical facets were very conspicuous in this species. The maxilla supports two large very compressed sabre-like teeth posteriorly which are fully twice the length of the preceding tooth, and separated from it by a short edentulous interval large enough to support one small tooth. These dental peculiarities are precisely those laid down by Mr. Boulenger to characterise his genus *Macropisthodon* as already pointed out by Annandale.*

Tropidonotus stolidus (Linné).

I collected 159 specimens, all but 20 from Dibrugarh. Of 89 sexed 62 were ♀♀, 27 ♂♂. The preponderance of ♀♀ over ♂♂ is remarkable, exceeding that already noted with regard to *T. piscator*. In none of these did I see any red ornamentation, the overlapped edges of the scales being always pale blue. Many of these were brought alive, and it is remarkable how its disposition contrasts with that of *T. piscator*. I have never been bitten by one though I have picked up many haphazard. The flattening of the neck is only seen in some specimens, though many erect their bodies. Some flatten themselves very remarkably, and in so doing reveal the pale blue colouring which is under other circumstances hidden. The breeding events, food, etc., will be best given in tabular form.

Date.	Sex.	Length.	Remarks.
1907.			
April 2nd ...	♂	1'-8"	2 præoculars on both sides.
" 2nd ...	♀	1'-10 $\frac{1}{2}$ "	Contained 5 eggs, the longest $\frac{1\frac{1}{2}}{16}$ ".
" 11th ...	♀	1'-11"	Contained eggs, the longest $\frac{7}{15}$ ".
" 11th ...	♀	tail docked.	Contained 6 eggs (4 + 2). $\frac{1\frac{5}{8}}{16}$ " long.
" 13th ...	♀	10 $\frac{3}{4}$ "	
" 15th ...	♀	...	Contained 5 eggs, $\frac{1}{2}$ " long.
" 17th ...	♂	1'-7 $\frac{1}{2}$ "	A small toad "in gastro."
" 22nd ...	♀	...	A toad "in gastro."
" 25th ...	♀	...	Contained 9 eggs (4 + 5). $\frac{3}{4}$ " long.
" 25th ...	♀	...	Contained 1 egg.
" 27th ...	♀	...	Contained 8 eggs, $\frac{3}{4}$ " long.
" 27th ...	♀	1'-8"	Contained 5 eggs, $\frac{2\frac{3}{8}}{32}$ " to $\frac{2\frac{5}{8}}{32}$ " long.
May 1st ...	♀	...	Dug up coiled with 7 eggs, one inch long: One contained an embryo 2 $\frac{5}{16}$ " long. Another clutch of 3 on same date.
" 2nd ...	♀	...	Contained 6 eggs (4 + 2), $\frac{2\frac{9}{16}}{32}$ " × $\frac{1\frac{1}{2}}{32}$ ".
" 2nd ...	♀	...	Contained 4 eggs (3 + 1), $\frac{1\frac{5}{8}}{32}$ " × $\frac{2\frac{6}{8}}{32}$ " long.
" 3rd ...	♀	...	Contained 8 eggs, $\frac{2\frac{7}{8}}{32}$ " long.
" 4th ...	♀	...	Contained 4 eggs (3 + 1) $\frac{1}{2}$ " long. On this date 5 other eggs were brought, measuring 1 $\frac{1\frac{1}{2}}{32}$ " × $\frac{1\frac{1}{2}}{32}$ ". A snake was reported to have been coiled up with them but escaped. Another clutch of 9 eggs also brought, one egg containing an embryo $\frac{3}{4}$ " long.
" 5th ...	♂	...	2 præoculars on both sides.
" 8th ...	♀	2'-3"	Contained 9 eggs, $\frac{3}{4}$ " long.

* Journal, Ass. Soc., Bengal, 1905, p. 210.

Date.	Sex.	Length.	Remarks.
1907.			
May 10th ...	♀	...	Contained 5 eggs.
" 11th ...	♀ ♀	...	Two gravid specimens.
" 11th ...	♀	2'-6"	Contained 12 eggs, the poles much flattened from pressure against one another.
" 11th ...	♀	...	Contained 5 eggs. Another on this date had the remains of a frog "in gastro" and another young specimen a gecko.
" 19th ...	♀	...	Contained 7 eggs (4 + 3).
" 21st	Two clutches each containing 7 eggs were brought in.
" 28th ...	♀	...	Gravid.
" 31st ...	♀	2'-4"	Contained 9 eggs.
June 3rd	5 eggs were brought containing embryos, 4 ♀ ♀, 1 ♂.
" 13th ...	♀	...	Contained several eggs.
" 16th	A clutch of 6 eggs brought in.
" 17th ...	♀	...	Contained several eggs. 9 eggs were also brought comprising two clutches.
July 2nd ...	♀	...	Contained 6 eggs.
" 15th ...	♀	...	A frog "in gastro."
Sept. 18th	A frog "in gastro."
Oct. 18th ...	♀	...	Two loreals ($\frac{1}{2}$) on each side.
" 30th	A frog in the gullet swallowed breach first.
1908.			
March 11th...	Two loreals ($\frac{1}{2}$) on each side.
" 27th ...	♀	...	A toad "in gastro."
April 2nd	A frog "in gastro."
" 3rd	A frog "in gastro."
" 5th ...	♀	...	Contained 10 eggs, $\frac{13}{16}$ " long.
" 20th...	♀	...	Gravid.
" 24th...	♀ ♀	...	Two gravid.
Oct. 13th ...	♀	...	Two loreals ($\frac{1}{2}$) on each side.

* Total length judged from other specimens, the tail being imperfect. The body length was 1'-11 $\frac{1}{2}$ ".

Another spirit specimen probably a hatchling contained a frog. It is curious that Mr. Boulenger in his catalogue gives the supralabials as numbering 8 normally, with the 3rd, 4th and 5th touching the eye when this arrangement though not uncommon is the exception. The supralabials in this species are specially subject to variation. I find that in nearly all my specimens there are 7 with the 3rd and 4th touching the eye. Very frequently too there are 8 with the 4th and 5th touching the eye, and occasionally but 6 with 3rd and 4th touching the eye. In a very large number there is a long shield which suggests that two (usually the 3rd and 4th) have become confluent, but so often is this the case that one can hardly take this view. I cannot see any apical facets on the costal scales.

In a clutch of eggs brought on the 21st of May a ♂ embryo measured $4\frac{3}{8}$ ". The genitals were extruded. Two of these hatched on the 10th June measuring 6" and $6\frac{3}{8}$ ". The sexes were not noted but there is no difference in size in this species at exuviation. A growth of $1\frac{1}{2}$ to 2 inches was attained in 20 days. Of 5 eggs brought on the 3rd of June 4 embryos were ♀ ♀ and 1 ♂. The ♀ ♀ measured from $5\frac{3}{8}$ to $5\frac{1}{8}$ " and the ♂ $5\frac{1}{8}$ ". The latter had the genitals extruded. On the 27th June 9 eggs were brought comprising two clutches. The embryos in one lot were $2\frac{1}{2}$ " long, and in the other a ♂ was $6\frac{1}{4}$ " and a ♀ $6\frac{3}{8}$ ", the genitals of the former being still extruded. On the 5th July 3 of the second lot hatched, and on the 6th 2 more. One of these escaped but the others were examined, as follows :—

Sex.	Length.	Ventrals.	Subcaudals.	Ventrals between navel and anal.	REMARKS.
♀	7"	151	77	14	4th and 5th right supralabials confluent.
♀	$6\frac{3}{4}$ "	153	77	15	4th and 5th supralabials confluent on both sides.
♂	$6\frac{1}{2}$ "	145	72	18	4th and 5th supralabials partially confluent on both sides.
♂	6'	152	78	15	4th and 5th right supralabials confluent.

In 8 or 9 days the growth of these embryos was in the ♂ $\frac{3}{16}$ ", and in the ♀ $\frac{2}{3}$ ". At the period of exuviation the ♂ genitals were no longer extruded.

In an embryo, which measured $4\frac{3}{8}$ ", the claspers were sausage-shaped bodies dimpled posteriorly where evidently the muscle (or ligament?) which retains the organ in its sheathed position in the adult is attached. By a contraction of this muscle shortly before hatching, the clasper would appear to become sheathed by being drawn within itself, much in the same way as the digits of a glove may be, on being withdrawn from damp fingers. In this specimen the ventrals were 157, the 26th to the 32nd covering the heart and the 88th and 89th the gall bladder. In an embryo $2\frac{1}{2}$ " long the heart was observed beating, first the auricle, and the ventricle contracting, the latter by its contraction making the transverse diameter of the organ as broad as its longitudinal diameter was in the interval (diastole). This snake is infested with just the same parasites as *T. piscator*. I sometimes found masses of the larval form of tapeworm (*Pterocercus*) in such quantity that I was misled into supposing a specimen gravid. The stomachs of several were very much thickened, indurated, and knuckled by the clusters of nematode worms (*Kalicephalus willeyi*) which attach themselves to the inside coats of this organ. The third parasite (*Porocephalus brntali*) was also frequently observed attached to tissues in the

abdominal cavity outside the alimentary canal. Some of these measured $\frac{3}{4}$ of an inch.

As regards dentition this appears to me to exactly agree with that of *T. himalayanus* and *subminiatus* in that the last two maxillary teeth are very much enlarged, and separated from the preceding one by a short edentulous gap.

Tropidonotus subminiatus, Schlegel.

I obtained 4 examples, 3 from Dibrugarh and 1 from near Halem. One of these I captured alive myself. It was disturbed by the servants, and took refuge in a small rubbish heap in a godown. When I flushed it, it erected the body, and flattened the neck very markedly, displaying it truly glorious colouration to the utmost advantage. The brilliant gamboge collar, intense vermilion band behind this, and the bright canary yellow chequering on the body were extremely ornamental and striking.

Apical facets are very distinct on the costal scales in this species.

Two specimens had eaten toads.

The dentition agrees with that of *T. stolatus* and *T. himalayanus*. There is a small gap between the small maxillary teeth and the two enlarged posterior ones. The latter are almost three times the length of the preceding tooth.

Trachischium monticola (Cantor).

I received one specimen from Mr. C. Gore of Namsang (near Jaipur). He tells me that he lives about 40 or 50 miles from the Naga Hills from which a spur runs in his direction, the altitude of which near him is perhaps 150 feet or so. In the plain where his estate is the altitude above sea level is only about 500 feet. It seems rather curious that this mountain species should be found at this low-level, but as will be seen hereafter Mr. Gore also sent me other mountain snakes from the same locality, viz., *Amblycephalus monticola*, *Dinodon septentrionalis*, and *Callophis maclellandi*. There is a specimen of this species in the Indian museum from Barrakur which I have examined. Barrakur though in the plains is within a short distance of the Parasnath Hill. The scales were in 15 rows in the whole body length. The ventrals and subcaudals 120 + 35.

Lycodon jara (Shaw).

Three specimens were collected. One I got in Dibrugarh, one from Sadiya, and one from Makum. The last was sent to me alive. It proved a very active spirited little reptile, striking out at me with great pluck and determination, and striving repeatedly by a series of jumps to escape. After being repeatedly brought back into the open, it sulked and made its body rigid as other *Lycodons* do. I turned it over on to its back, and it lay immobile belly uppermost as though feigning death. The tongue was noticed when protruded to have white tips. The ground colour of this species is black with a slight greenish tinge in it. The twin spots on each scale are yellow in life as already remarked by Theobald not white as stated by Boulenger. The collar too is yellow. As in other *Lycodons* the eye is black in life so that the pupil cannot be seen. In

all the specimens I have seen including those from the neighbourhood of Darjeeling the supralabials are 8 with the 3rd, 4th and 5th touching the eye, not 9 or 10 as stated by Boulenger. The scales at a point two heads-lengths behind the head are 17, in midbody 17, and at a point two heads-lengths before the anus 15. As in other *Lycodons* the reduction from 17 to 15 is effected by a confluence of the 3rd and 4th rows above the ventrals. One specimen was imperfect. In the other two the ventrals and subcaudals were ♀ 185 + 66 and ♂ 190 + 71. The ♂ was 1 foot 7½ inches long, the tail 4½ inches, and the ♀ was 1 foot ½ inches, the tail 4 inches.

The dentition is similar to that of other *Lycodons*. The maxilla supports an anterior and a posterior set of teeth separated by a considerable arched edentulous interval. In the anterior set the first three teeth are small but progressively increase in size, then come two long fang-like teeth about twice as long as the 3rd. In the posterior set are 7 small subequal teeth, then two enlarged and fang-like about twice as long as the preceding. The palatopterygoid series number 13 + 16 and are all small and subequal. In the mandible there are anteriorly three small progressively increasing teeth followed by two large and fang-like, then a gap followed by 14 small subequal teeth.

Lycodon aukcus (Lionie).

I acquired 47 specimens. Of 37 sexed 21 were ♂♂, and 16 ♀♀. The living ones that were brought were as usual very lively, and in their endeavours to secure their liberty moved in a series of jumps. I could not assert that the reptile left the ground, though it certainly sometimes appeared to do so. One specimen I encountered at night in my bathroom. It had just seized a gecko, but as soon as I came upon the scene with a light, it dropped the lizard and rounded upon me with open jaws in a most truculent manner. Breeding and other notes are given in tabular form:—

Date.	Sex.	Length.	REMARKS.
1907.			
March 30th...	♂	1'-11"	Supralabials 10, the 3rd, 4th and 5th touching the eye on the right side. Seen in the roof of a house in the bazaar.
April 4th ...	♀	1'-4¾"	Gravid but eggs all broken up.
" 26th ...	♂	1'-9¼"	Found in upstairs room of bungalow. A gecko had been eaten.
" 26th ..	♂	1'-8¼"	Killed in a native house in daylight.
" 27th ...	♀	2'-2"	Contained 11 eggs (6 + 5), ¾" to 1" long. Killed in a native house.
May 5th ...	♂	1'-7"	Killed in the roof of a house.
" 8th ..	♀	1'-8½"	Contained 3 eggs, ¾" long. A mouse "in gastro."
" 10th ...	♀	1'-1½"	
" 15th ..	♂	2'-6"	
" 24th ...	♀	2'-1"±	Contained 6 eggs ¾" long.

* Tail imperfect, but length judged from other specimens. The body was 1 foot 9¼ inches long.

Date.	Sex.	Length.	REMARKS.
1907			
May 26th ...	♂	2'-3 $\frac{1}{8}$ "	Hair of mammal "in gastro." Killed in native hut at midnight.
" 31st ...	♂	2'-0 $\frac{1}{2}$ "	
June 16th ...	♂	1'-1 $\frac{3}{8}$ "	3 postoculars on both sides. A gecko "in gastro". Killed in roof of a house.
" 16th ...	♂	2'-0 $\frac{1}{2}$ "	
" 18th ...	♀	1'-1 $\frac{1}{2}$ "	Ventrals and subcaudals 197+73.
" 26th ...	♀	1'-10 $\frac{1}{2}$ "	Ventrals and subcaudals 210+67.
July 9th ...	♂	1'-7"	The anal and the first 3 subcaudals entire.
" 9th ...	♂	1'-9 $\frac{1}{4}$ "	Found on a beam in a house.
" 13th ...	♀	1'-4 $\frac{3}{4}$ "	
" 18th ...	♀	7 $\frac{3}{8}$ "	Ventrals and subcaudals 206+68. Killed in roof of native hut. A hatchling.
Oct. 7th ...	♀	1'-6 $\frac{1}{2}$ "	Ventrals and subcaudals 204+63.
" 27th ...	♀	1'-8"	Had just siezed a gecko in bathroom of my house at night.
Nov. 11th ...	♀	1'-7"	Ventrals and subcaudals 205+65.
Dec. 2nd ...	♀	9 $\frac{1}{8}$ "	
1908.			
Mar. 11th ...	♀	1'-0 $\frac{1}{4}$ "	Ventrals and subcaudals 197+69
April 10th ...	♀	...	Contained 6 eggs, $\frac{1}{16}$ " long.
" 10th ...	♀	1'-9"	3 ovarian follicles apparently impregnated.
" 10th ...	♀	2'-0"	Contained 8 eggs, rather more than one inch long.
" 21st ...	♀	2'-1 $\frac{1}{4}$ "	} Both found together in an old brick wall of a house. The ♀ contained 7 eggs varying from $\frac{1}{16}$ " to $1\frac{1}{8}$ " long.
" 21st ...	♀	2'-4"	
May 18th ...	♂	1'-11 $\frac{1}{4}$ "	{ Both found together in a hole in a bath-room. The second specimen was cut in half, and the anterior part only brought.
" 18th ...	♂	...	
" 21st ...	♂	1'-7 $\frac{1}{4}$ "	A nearly digested gecko "in gastro."
June 5th ...	♀	1'-6 $\frac{3}{4}$ "	
Sept. 21st ...	♂	...	Killed in a house.
Oct. 18th	3 postoculars on the left side.

A spirit specimen sent to me had 9 supralabials with the 3rd, 4th, 5th and 6th touching the eye on the right side.

The specimens were all of one variety. The labials were spotted, mottled or sullied with brown, or uniformly whitish. The ground colour was brown of various shades, and the cross-bars yellow or yellowish, numbering 10 to 15 in the anterior half of the body. On the 18th July 5 eggs were found in a Planter's bungalow. Four of these hatched out one escaping; the fifth egg was not fertile. Two hatchlings measured 6 $\frac{1}{8}$ " and one 6 $\frac{3}{4}$ ". Two believed to be ♀♀ had the ventrals and subcaudals 209 + 66 and 208 + 67, and in both these 27 ventrals were interposed between the navel and the anal shield. In the specimen believed to be a male the ventrals and subcaudals numbered 197+68, and 28 ventrals intervened between the navel and the anal shield.

On the 31st July two hatchlings were discovered on a gun case in the corner of a room. One measured 6 $\frac{2}{5}$ " and the other 7 $\frac{1}{8}$ ".

Dinodon septentrionalis (Günther).

I received a small living specimen from Mr. Gore captured at Namsang.® It was a very beautiful little snake with its coal-black ground colour and milky-white cross-bars, resembling very closely the many banded Krait (*Bungarus multicinctus*) for which I at first took it. In certain lights the black had a purplish tinge. There were 27 white bars on the body and 17 on the tail. It was a ♀, and measured 2 feet 1 $\frac{5}{8}$ inches, of which the tail accounted for 5 $\frac{1}{4}$ inches. The ventrals and subcaudals were 214 + 81, the former angulate. The anal entire. The scales at a point 2 heads-lengths behind the head were in 17 rows, at midbody 17, and at a point 2 heads-lengths before the anus 13. This last is unusual, the rows at this site being normally 15. The reduction from 17 to 15 caused by a fusion of the 3rd and 4th rows above the ventrals. The eye in life was quite black, but the pupil was subsequently noted to be vertical.

Zaocys nigromarginatus (Blyth.)

I may here mention that an Officer at Kohima in the Naga Hills sent me a coloured picture of a snake caught and killed in his garden on the 21st May, which had excited his admiration and interest. There can be no doubt as to its identity. The body is coloured foliaceous-green with the scales edged black. The head is brown on the snout, merging to green on the occiput. The characteristic black bands down the tail are also nicely shown. The specimen measured 7 feet 6 inches.

Zamenis korros (Schlegel).

Thirteen specimens were collected, all from Dibrugarh except one from Sadiya. Of those sexed 4 were ♂♂, 7 ♀♀ —

Date.	Sex.	Total length	Tail.	Ventrals.	Subcaudals.	REMARKS.
1907.						
May 10th.	♂	5' 9"	.....	186	135	One loreal on the right side.
" 13th.	♀	5' 4 $\frac{1}{4}$"	.....	...	...	Tail imperfect. On the left side there were 3 loreals (1+1) Contained 5 eggs. 1 $\frac{11}{32}$ " × 1 $\frac{6}{32}$ "
June 12th.	♂	4' 10 $\frac{1}{4}$ "	1' 9"	182	147	9 supralabials on the both sides.
" 18th.	♀	4' 9 $\frac{1}{2}$ "	1' 8"	...	...	9 Supralabials on the left side, the 5th and 6th touching the eye. Contained 3 eggs. 1 $\frac{1}{2}$ " × 1 $\frac{12}{32}$ "
" 21st.	♀	4' 2 $\frac{1}{2}$"	.....	...	...	Tail imperfect. Contained 6 eggs. 1 $\frac{1}{2}$ " × 1 $\frac{1}{2}$ "
July 4th...	♂	5' 4 $\frac{1}{2}$ "	1' 10 $\frac{1}{3}$ "	182	146	
" 18th.	♀	4' 8 $\frac{1}{2}$ "	1' 8 $\frac{1}{8}$ "	179	146	Contained 4 eggs (2+2), 1 $\frac{11}{32}$ " × 1 $\frac{13}{32}$ "
1908.						
June 2nd.	♂	3' 0 $\frac{1}{16}$ "	1' 0 $\frac{1}{8}$"	...	...
" 4th...	♀	4' 10 $\frac{1}{4}$ "	1' 9 $\frac{1}{8}$"	...	...	Contained 1 egg, 1 $\frac{15}{16}$ "
" 5th ..	♀	3' 1 $\frac{1}{8}$ "	1' 1 $\frac{1}{2}$ "	178	140	

* See remarks on this locality under *Trachischium monticola*, p. 618.

In this species the costals are in 15 rows at a point two heads-lengths behind the head, 15 in midbody, and 11 at a point two heads-lengths before the anus. The scales reduce from 15 to 13 close behind midbody, the 3rd row above the ventrals being absorbed into the row above or below. Shortly afterwards the rows become 11 by a similar absorption process.

A specimen from Sadiya had but one loreal on both sides. The eggs when immature are extremely elongate resembling a date stone somewhat in shape. The length is often three times the breadth, but as they mature the relative breadth increases. The secretion of the anal glands is creamy-white.

The dentition in a skull before me is as follows:—*Maxillary*.—28 teeth in a continuous series, the posterior gradually and slightly enlarged. *Palato pterygoid*.—18+28, small and subequal. *Mandibular*.—25, the first 3 gradually increasing in size the next few teeth subequal to the 3rd and then there is a gradual reduction in length posteriorly. Boulenger in his catalogue gives among his generic characters a range of from 12 to 20 maxillary teeth. It is to be noted also that he states that the body in this genus is cylindrical. In both this and the next species there is a very notable compression of the body.

Zmeus mucosus (Linne).

The Assamese call this snake "Qwalla samp," and believe that it sucks the teats of cows. They state that they wind themselves round the cows' hind legs, and bind them, and then suck the milk.

Of 44 sexed 25 were ♂♂, 19 ♀♀. In my popular article on this snake, Vol. XVIII, page 257, I mentioned that contrary to what is the rule in snakes the ♂ of this species appeared to grow larger than the ♀. This receives substantial support from the notes I made in Dibrugarh. I find that I had no less than 9 ♂♂ exceeding 6 feet in length and only one ♀♀ which was 6 feet 2 inches. The longest specimen was 7 feet 4 inches. On one occasion one was found in the same hole as a large black krait (*B. niger*). On another occasion one was seen to disappear in a hole and when dug up two were flushed and killed, both females. On another occasion under similar circumstances two males were dug out of the same hole in May and in the hole was a cluster of egg shells which appeared to be those of a dhaman. They measured $1\frac{3}{4}$ inches in length, were 9 in number and obviously the production of last season. In a ♀ killed on the 30th April, 10 (9+6) follicles were impregnated. In another killed on the 12th June, there were 8 (6+2) eggs measuring $\frac{23}{32}$ " long. In a third, killed on the 26th July, there were several eggs, $\frac{29}{32}$ " long and $\frac{8}{32}$ " broad. As in the case of the last species the eggs are remarkably elongate in their early stages of development. Several had recently fed. Toads of the species *Rhysomelanus melanostictus* had twice been taken, a frog twice, a large skink (probably *Mabius carinata*) once, and a large fledgling twice, probably that of a crow in one instance, and a young ♂ koel in the other. The feathers of the latter were black tipped with rufous as observed by Dewar (*vide* this Journal, Vol. XVII, p. 781). One specimen had 5 loreals on both sides, and another had the 49th, 50th and 51st subcaudals entire.

The dhaman is of a very dark colour in this part of India, many specimens being sepia or black with the markings much obscured, so that at a very short distance they appear uniformly coloured.

One specimen, which was brought alive, but fortunately so damaged in the hind part of the body as to find progression difficult, struck out fiercely at me pouching the throat, and uttering that curious groaning note that I have heard no other snake produce. My wife who was with me at the time was also struck at and heard the noise to which I refer distinctly. One was reported to have been attacking a fowl when observed and killed.
